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The index number of securities prices (the Bourse index) contains quotations of 25 shares and 10 bonds. Its fluctuations are summarized in the following table:

INDEX NUMBERS OF SECURITIES PRICES

	10 Bonds	25 Shares	Total
1919			
September 1.....	97	79	87
1920			
January 1.....	100	100	100
February 1.....	120	139	*137
March 1.....	145	*158	*157
May 3.....	114	*135	133
June 1.....	105	110	109
July 1.....	106	119	117
August 2.....	106	144	140
September 4.....	*122	152	*148
October 2.....	122	*165	160
November 6.....	143	*181	177
December 4.....	136	184	178
1921			
January 8.....	132	*202	194
February 5.....	121	165	159
March 5.....	118	*158	153
April 2.....	117	169	163
May 7.....	120.5	*166	*161
June 4.....	120.6	172	166
July 2.....	125	188	181

* Corrected in accordance with the aggregate prices published by the *Frankfurter Zeitung*. In these cases the index number published does not agree with the corresponding absolute figures. The deviations are in most cases very slight.

FAITH M. WILLIAMS

Federal Reserve Board

ON PROFESSOR MORITZ' METHOD FOR COMPUTING FREQUENCY PERCENTAGES

In a recent article* Professor Moritz sets forth a new method for computing frequency percentages. The same method may be applied in computing the percentages that the frequencies are of N . In certain psychological experiments each of N individuals attempts all of a number of problems, and the frequencies of success or failure for each problem are

$$f_1, f_2, f_3, \dots, f_n.$$

It is required to compute the percentages

$$P_k = 100f_k/N, \quad k = 1, 2, 3, \dots, n.$$

The two steps in the method analogous to those of Professor Moritz will be:

(1) Replace the frequencies f_k by proportional numbers f'_k , the factor of proportionality being N'/N , where N' approximates 100.

(2) Distribute the difference $D = 100 - N'$ over the numbers f'_k in accordance with the formula $\Delta f'_k = f'_k \cdot D/100$, where $\Delta f'_k$ is that portion of D which falls to f'_k .

* "On a New Method of Computing Frequency Percentages," QUARTERLY PUBLICATIONS OF AMERICAN STATISTICAL ASSOCIATION, March, 1921.

Since $N' + D = 100$ it follows that

$$P_k = f_k \frac{(N' + D)}{N}.$$

The approximation P'_k is obtained by multiplying the small quantity D/N by $N'/100$, the last ratio approximating unity. Thus,

$$P'_k = f_k \left(N'/N + \frac{DN'}{100N} \right) \text{ or}$$

$$P'_k = f'_k + \Delta f'_k.$$

It may be noted that the error

$$P_k - P'_k = f'_k \frac{(100 - N')^2}{100N'}.$$

The relative error is given by the expression

$$R = \left[\frac{100 - N'}{100} \right]^2.$$

The following problem illustrates the method:

FREQUENCY AND PER CENT FAILING

k	f_k	f'_k	$\Delta f'_k$	P'_k
1	4	2.4	-.02	2.38
2	7	4.2	.03	4.17
3	15	9.0	.07	8.93
4	28	16.8	.13	16.67
5	35	21.0	.17	20.83
6	43	25.8	.21	25.59
7	64	38.4	.31	38.09
		117.6 + -.94 = 116.66 (check)		

Suppose $N = 168$. Choose $N'/N = .6$ so that $N' = 100.8$. (1) $f'_k = .6f_k$. (2) $100 - N' = -.8$, $\Delta f'_k = -.8\%$ of f'_k .

It may be noted that the advantages of the above method are limited unless N'/N is chosen so as to give a simple ratio. In the above example all of the calculations may be done mentally.

KARL J. HOLZINGER

ANALYTICAL SUMMARY OF THE NEW ZEALAND CENSUS OF 1916*

In a recently issued report the principal facts of the New Zealand Census of 1916 are summarized and analyzed. The tabular parts of the census have already

* *Report on the Results of a Census of the Population of the Dominion of New Zealand taken for the Night of the 15th October, 1916.* Malcolm Fraser, Government Statistician, Wellington. By authority: Marcus F. Marks, Government Printing, 1920.